

U.S. PATENT APPLICATION NO. 10/709,615
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CENTRAL FAX CENTER

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Amendments to the Claims:

The listing of claims below replaces all previous versions of the claims in this application.

1. (Currently Amended) A vortex tube cooling system, comprising:
a housing adapted for subsurface disposal, the housing containing:
a first pressure chamber;
a vortex tube coupled to the first pressure chamber;
a cooling chamber coupled to the vortex tube; and
a second pressure ~~chamber coupled~~ chamber coupled to the cooling chamber;
wherein the pressure chambers are adapted to stimulate a cool fluid flow from the vortex tube into the cooling chamber.
2. (Original) The system of claim 1, wherein the first pressure chamber is adapted for pressurization and the second pressure chamber is adapted for evacuation.
3. (Original) The system of claim 1, the housing further comprising a third pressure chamber coupled between the first pressure chamber and the vortex tube, the third chamber adapted to sustain a predetermined fluid pressure for input to the vortex tube.
4. (Original) The system of claim 1, the housing further comprising a heat exchanger coupled between the second pressure chamber and the vortex tube, the exchanger adapted to receive hot fluid flow from the vortex tube.
5. (Original) The system of claim 1, the housing further comprising a compressor adapted to pump a fluid from the second pressure chamber into the first pressure chamber.
6. (Currently Amended) The system of claim 5, the housing further comprising:
a third pressure ~~chamber coupled~~ chamber coupled between the cooling chamber and the second pressure chamber; and
a second compressor adapted to pump a fluid from the third chamber into the second chamber.

7. (Original) The system of claim 1, wherein the cooling chamber is double walled and adapted to allow fluid flow from the vortex tube through a space between the walls.
8. (Original) The system of claim 1, wherein the housing is adapted for disposal within a borehole traversing a subsurface formation while drilling the borehole.
9. (Original) The system of claim 1, wherein the housing is adapted for disposal within a borehole traversing a subsurface formation via a wireline cable.
10. (Original) The system of claim 1, further comprising a plurality of valves linked between the first, second, and cooling chambers to regulate fluid flow through the chambers.
11. (Original) The system of claim 1, wherein the cooling chamber is adapted to house an electronic component.
12. (Original) The system of claim 1, wherein the exterior of the first pressure chamber, second pressure chamber, or cooling chamber is covered by an insulating material.
13. (Original) The system of claim 1, wherein the first pressure chamber, second pressure chamber, or cooling chamber is disposed within a Dewar flask.
14. (Original) A vortex tube cooling system, comprising:
 - a housing adapted for subsurface disposal, the housing containing:
 - a first pressure chamber adapted to sustain high fluid pressure;
 - a vortex tube coupled to the first pressure chamber;
 - a cooling chamber coupled to the vortex tube;
 - a second pressure chamber coupled to the cooling chamber and adapted to sustain lower fluid pressure in relation to the first pressure chamber;
 - at least one valve linked between the first pressure chamber and the cooling chamber to regulate fluid flow to stimulate a cool fluid flow from the vortex tube into the cooling chamber.

15. (Original) The system of claim 14, wherein the cooling chamber is double walled and adapted to allow fluid flow from the vortex tube through a space between the walls.
16. (Original) The system of claim 14, the housing further comprising a compressor adapted to pump a fluid from the second pressure chamber into the first pressure chamber.
17. (Original) The system of claim 16, the housing further comprising a third pressure chamber coupled between the first pressure chamber and the vortex tube, the third chamber adapted to sustain a predetermined fluid pressure for input to the vortex tube.
18. (Original) The system of claim 16, the housing further comprising a heat exchanger coupled between the second pressure chamber and the vortex tube, the exchanger adapted to receive hot fluid flow from the vortex tube.
19. (Currently Amended) The system of claim 16, the housing further comprising:
a third pressure ~~chamber coupled~~ chamber coupled between the cooling chamber and the second pressure chamber; and
a second compressor adapted to pump a fluid from the third chamber into the second chamber.
20. (Original) The system of claim 14, wherein the housing is adapted for disposal within a borehole traversing a subsurface formation while drilling the borehole.
21. (Original) The system of claim 14, wherein the housing is adapted for disposal within a borehole traversing a subsurface formation via a wireline cable.
22. (Original) The system of claim 16, further comprising a plurality of valves linked between the first, second, and cooling chambers to regulate fluid flow through the chambers.
23. (Original) The system of claim 14, wherein the cooling chamber is adapted to house an electronic component.

24. (Original) The system of claim 14, wherein the exterior of the first pressure chamber, second pressure chamber, or cooling chamber is covered by an insulating material.
25. (Original) The system of claim 14, wherein the first pressure chamber, second pressure chamber, or cooling chamber is disposed within a Dewar flask.
26. (Currently Amended) A method for cooling a component within a housing adapted for subsurface disposal, comprising:
- a) equipping the housing with:
 - a first pressure chamber;
 - a vortex tube coupled to the first pressure chamber;
 - a cooling chamber coupled to the vortex tube;
 - a second pressure ~~chamber coupled~~ chamber coupled to the cooling chamber;
 - b) disposing the component to be cooled within the cooling chamber; and
 - c) adapting the pressure chambers to stimulate a cool fluid flow from the vortex tube into the cooling chamber.
27. (Original) The method of claim 26, wherein step (c) comprises pressurizing the first pressure chamber and evacuating the second pressure chamber.
28. (Original) The method of claim 26, wherein step (c) comprises pumping a fluid from the second pressure chamber into the first pressure chamber.
29. (Original) The method of claim 26, further comprising equipping the housing with a heat exchanger coupled to the vortex tube to receive hot fluid flow from the vortex tube.
30. (Currently Amended) The method of claim 26, further comprising equipping the housing with a third pressure ~~chamber coupled~~ chamber coupled between the cooling chamber and the second pressure chamber, and pumping a fluid from the third chamber into the second chamber.
31. (Original) The method of claim 26, wherein the cooling chamber is double walled and adapted to allow fluid flow from the vortex tube through a space between the walls.

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32. (Original) The method of claim 26, further comprising disposing the housing within a borehole traversing a subsurface formation while drilling the borehole.
33. (Original) The method of claim 26, further comprising disposing the housing within a borehole traversing a subsurface formation via a wireline cable.
34. (Original) The method of claim 26, further comprising equipping the housing with a plurality of valves linked between the first, second, and cooling chambers to regulate fluid flow through the chambers.
35. (Original) The method of claim 26, wherein the component to be cooled is an electronic component.
36. (Original) The method of claim 26, wherein the exterior of the first pressure chamber, second pressure chamber, or cooling chamber is covered by an insulating material.
37. (Original) The method of claim 26, wherein the first pressure chamber, second pressure chamber, or cooling chamber is disposed within a Dewar flask.